Clinical review

How to investigate and manage the child who is slow to speak

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Children who are slow to speak often present clinicians with a dilemma—should they conduct further investigations or just wait and see if the problem resolves (as it does in most children aged under 3 years)? Two paediatricians propose a guideline that can be used to investigate and manage children with speech or language delays

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Delay in speech and language development is the most common developmental disorder in children aged 3 to 16 years. The prevalence of this disorder ranges from 1% to 32% in the normal population and is influenced by factors such as the age of the child at presentation and the test method used in diagnosis.[1 2] A high rate of comorbidity (up to 50%) is known to exist between psychiatric disorders such as autism and disorders of speech and language development.[3] Despite the prevalence and reported risks of comorbidity, however, about 60% of cases of speech and language delay tend to resolve spontaneously in children aged under 3 years.[1] Children who are slow to speak form a particular category of patients with speech and language developmental disorders and often present clinicians with a dilemma—whether to conduct further investigations or just wait and see. This is because a delay in speaking could be either a normal (and temporary) stage in the child's development or the initial symptom of a psychiatric, neurological, or behavioural problem. As a result, the timely diagnosis, choice of therapy, and an individualised approach to the child with a speech and language delay become imperative as these interventions may prevent subsequent psychological or psychiatric problems later in life.

We provide here an update of the current literature on speech and language development in children. Using a real patient encounter, we illustrate how a child with a delay in language development is presented to the clinician. We also propose a guideline that can be used to investigate and manage children with speech or language delays.

Summary points

- Delay in speech and language development in children can be defined as a "delay in speech and/or language development compared with controls matched for age, sex, cultural background, and intelligence"
- To evaluate such children, carefully analyse the child's cognitive strengths and weaknesses
- The analysis should take account of the history and context in which the child is developing, the observed performance of the child, and the results of a validated test of cognitive function
- In all cases of suspected speech and language delay, audiometry and a good clinical evaluation of the central nervous system and ear, nose, and throat are mandatory
- The management of children with speech and language delay should be multidisciplinary, involving the child's parents and school teacher, as well as various health professionals

Sources and selection criteria

We did a database search on Medline (National Library of Medicine) using the following key words: "speech and language disorders", "children (0-18 years)", "screening methods", "diagnostics", and "interventions". We chose relevant review and research articles that had been published on the subject after 1990 because we were interested in the latest developments in the area. We used 10 articles to prepare this report, chosen on the basis of the originality of content and relevance to the topic of this review. We used two paediatric neurology textbooks as additional sources of information. A general practitioner, general paediatrician, paediatric neurologist, and linguist commented on the review.

Definitions

Several definitions exist to describe delayed language development in children, reflecting the screening and diagnostic methods used by different institutions.

P+ *A fuller summary box and three boxes about classifying and evaluating speech and language disorders are on bmj.com*

Nevertheless, any definition should include one of two statements: that a speech and language delay is *(a)* a delay in speech and/or language development compared with controls matched for age, sex, cultural background, and intelligence, or *(b)* a discrepancy between a child's potential ability to speak and the performance that is actually observed.

Language development

A thorough knowledge of language development in the population of normal children is necessary when investigating a delay in speech or language development. According to Fenson et al, the order of the language learning process is firm but with a great range of variation in timing.[4] This makes it difficult for the clinician to discriminate normal (but delayed) language development from a typical disorder of language development. In the normal language learning process, children start babbling at 6-10 months, understand words by 8-10 months, and, on average, speak their first words around their first birthday. By 14-24 months, most children start to produce two-word phrases, and at 3 years a child should be able to make three-word combinations. At the age of 4 years, clear syntax is part of most children's speech.[5]

Domains of language development

To analyse language and to define language disorders most linguists divide language into four domains: phonology, grammar, semantics, and pragmatics.

Phonology refers to the ability to produce and discriminate the specific sounds of a given language. Phonological receptivity to different languages is optimal at birth but starts to decline at about age 10 months, reaching a rather general inability to acquire native phonology by preadolescence.

Grammar refers to the underlying rules that organise any specific language. Children start to learn grammar when they start to speak about objects, people, and actions.

Semantics, the study of meaning, includes the study of vocabulary and the number of words a child knows. The size of a child's vocabulary is thought to be the best predictor of school success.[1]

Pragmatics refers to the ability of the child to use his or her language in interactions with others. Understanding and producing language is a complex process in which different systems are involved. Chevrie-Muller and Rigoard described these systems in their neuropsycholinguistic model as the complex interactions of the brain (cerebral cortex), semantics and pragmatics, phonology, grammar, and language production.[6] They showed how these systems were interrelated and how a disturbance at any one of the levels could result in language impairment.

A universal classification of language disorders in children is difficult to provide because there are different ways of approaching the problem. We suggest a classification of speech and language development disorders (that is, receptive, expressive, or combined disorders) based on the systems involved in language development[6] and whether the disorder is secondary to an underlying organ dysfunction, cognitive disorder, or both (see box A on bmj.com).

Identifying and managing the child who is slow to speak

Parents of children with symptoms of delayed speech and language development usually approach a clinician when the child is 18-36 months old. In such cases any concern that something may be wrong with the child should be taken seriously, as parents' observations of abnormal behaviour in children at this age are quite accurate.[7] In older children, however, preschool and school records may provide clinicians with the necessary information about delayed language development.[3]

No clear cut approach exists on how to manage children with speech or language delay because external factors—such as the cause of the delay, the severity of presenting symptoms, availability of screening, and treatment facilities—may vary enormously. We propose a guideline that may be helpful in investigating and managing a child who is slow to speak. Although the components and the outline of the guideline are empirical, we consider it a pragmatic resource. It helps the clinician to discern the pattern, cause, and severity of the disorder, as well as helping to choose the appropriate intervention. We also present the case of a child with suspected speech developmental delay as an example (see box).

Case study

Presentation—Tyrone Biezen, a 3½ year old toddler, was found to have a delay in his speech development during a routine follow up evaluation at the infant welfare clinic. The general practitioner to whom he was referred recommended that his speech and cognitive development be assessed by a linguist and child psychologist respectively. Tyrone's intellectual ability was assessed with the SON-IQ test. His scores on the test were low, but scores from other tests of cognition were adequate for his age. The child psychologist reported that after the assessment Tyrone suddenly covered his eyes with both hands and failed to respond to instructions for a couple of minutes. She was alarmed by this unusual behaviour, and she asked the general practitioner whether it was pathological or secondary to an underlying neurological disorder. Tyrone was referred to a paediatrician, who would assess whether an evaluation by a paediatric neurologist was indicated and whether Tyrone had an existing neurological condition requiring investigation with brain imaging.

Background—Tyrone's parents were Surinamese and lived in the Netherlands. They both spoke Dutch, which was the language spoken at home. The pregnancy and the postnatal period were reportedly uneventful. Tyrone had attained all developmental milestones, including speech development, normally. At age 18 months, however, there was a temporary standstill in his speech development. His mother could not explain this delay, although she said that the intervention by the linguist after this period was very helpful. Physical examination showed a healthy, obese child. There were no morphological abnormalities that suggested a syndrome. All tests of neurological function were normal.

Conclusion—The notable improvement in Tyrone's speech after the linguist's intervention made a neurological disorder unlikely. The scores of the IQ test were unreliable and probably an underestimation because Tyrone was uncooperative during the test. In retrospect, the unusual behaviour noticed after the examination was intentional, which made epilepsy unlikely. In this case, the most probable cause of Tyrone's language delay was poor language stimulation relative to his needs. His parents were relieved to hear that the cause was not neurological. They were encouraged to continue speech therapy with the help of the linguist. No brain imaging studies were needed, although follow up visits were indicated. About four months later, his parents reported appreciable improvement in his speech.

Assess pattern of speech or language delay

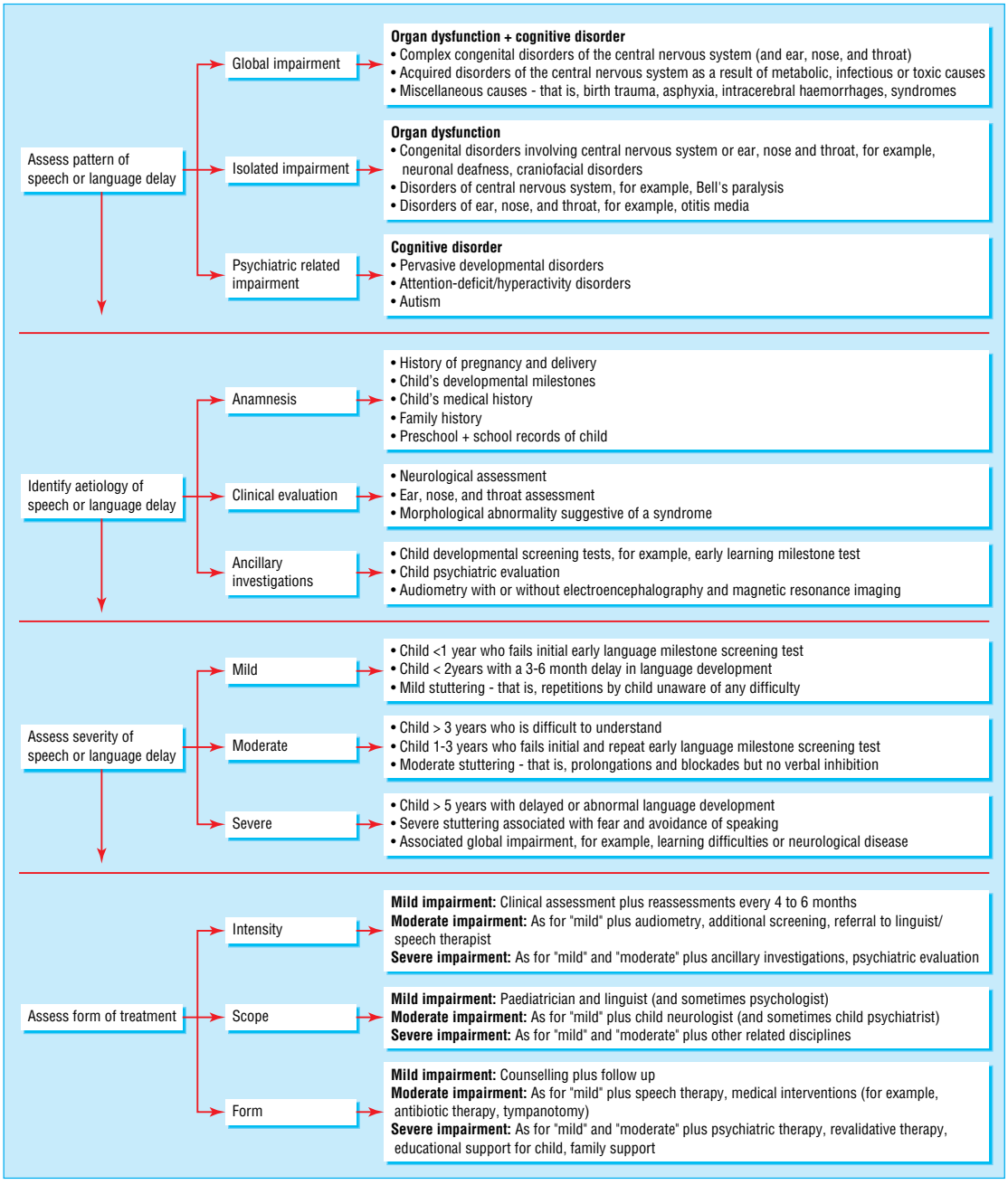
Characterising the pattern of a speech or language delay into isolated, global, or psychiatric related impairment can be helpful in finding its cause.

Isolated impairment is when the disorder is limited to language expression or production—for example, stuttering or an articulation disorder. Global impairment is when the disorder forms part of general developmental delays—for example, syndromes or disorders secondary to severe underlying disease. With psychiatric related impairment, the delay is associated with disorders such as attention-deficit/hyperactivity disorder or pervasive developmental disorders.

Global impairments in children are more likely to have poorer outcomes than isolated impairments and therefore require a more aggressive therapeutic approach. In addition, as the initial patterns of language impairment often change with time, the distinction between global and isolated language impairments might become difficult as a child grows older.

Identify aetiology of speech or language delay

The first step in identifying the cause of a speech or language delay in a child includes obtaining a thorough history of the pregnancy and delivery, developmental milestones, and family history. A history of any trauma, prematurity, asphyxia, or congenital intrauterine infection that may damage the central nervous system should alert the clinician. Children with a family history of deafness or who have had bacterial meningitis or recurrent or persistent (serous) otitis media



Algorithm for evaluating and managing children who are slow to speak

are at risk of a speech or language delay. Impairment in expressive language has been reported as early as 12 months in children with recurrent otitis media.[5] As a result, the prevalence of deafness in childhood, which is at least 2-3 per 1000 children at birth, doubles when acquired hearing loss is included.[5]

A good clinical evaluation, including a meticulous assessment of the central nervous system and structures of the ear, nose, and throat, is therefore mandatory. Infants may also provide clues about their hearing abilities in their behaviour. Poor prelinguistic behaviour, such as poor visual responsiveness and failure to respond to elementary tests, are signals that should alert the doctor to potential speech or language delay.

In all cases of a suspected delay, audiometry or brainstem evoked potentials are compulsory. Screening tools (which the clinician can use during the consultation) for assessing cognitive skills can be helpful in deciding whether further language, cognitive, or academic testing is needed—for example, the early language milestone test, the Woodcock reading mastery test.[5 8 9] With bilingual children, however, the clinician should consider the cultural and linguistic appropriateness of the screening tool[1 2] because bilingual children form a distinct category of children who may show language delay at a certain time without necessarily being impaired. In addition, in such cases the evaluation of language development should preferably be in the child's primary or native language.[2] Although aetiological investigations are acceptable when specific and physical clues are present, routine neuroimaging, investigations for rare disorders of metabolism, and chromosome studies are unlikely to be informative. In cases of clear language regression or variation in the severity of the speech disorder, electroencephalography during sleep may be helpful to rule out subclinical epilepsy or syndromes such as Landau-Kleffner syndrome.[10]

Finally, the clinician should search for other problems (apart from the cause of the speech impairment) that may need intervention, such as Axis I disorders (for example, attention-deficit/hyperactivity disorder), concerns with self esteem, or parental beliefs or accusations that disturb the child's development. Possible environmental causes and contributors to poor academic achievement or speech and language disorders—for example, disorganised homes, child abuse, or neglect—should also be ruled out.[3]

Assess severity of delayed speech or language delay

Assessing the severity of a delay in speech or language development can be helpful in tailoring the intensity, scope and form of therapy.[11] A proposed classification of the severity of a speech or language development delay is shown in box B on bmj.com

Treatment

Delays in speech and language development in children should be detected as early as possible to ensure optimal treatment and to prevent psychiatric problems later in life.[12] This process of detection and treatment should be multidisciplinary, involving the parents, school teacher, paediatrician, paediatric neurologist, ear, nose, and throat specialist, child psychiatrist, child psychologist, linguist, and speech pathologist. Specific language and cognitive deficits in a child should be taken into account when providing treatment and should focus on the interrelation among voice, speech, language, and cognition.[5] The aetiology, pattern, and severity of the language should determine the choice of therapy in terms of intensity (extent of investigations), scope (professionals involved in the management), and form (type of treatment offered). The goal of treatment should include minimising disability and maximising the child's potential (see box C on bmj.com).[3]

Conclusion

The evaluation of children with speech or language disorders demands an understanding of basic definitions and processes involved in language development. Clinicians should be aware of the appropriate interventions in order to make efficient referrals and monitor progress effectively. In the evaluation and management of children who are slow to speak, we strongly recommend a good account of the child's medical history, development, and performance, as well as a careful analysis of the child's cognitive strengths and weaknesses with a validated screening test of cognitive function (see figure).

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Additional educational resources

Suggested reading

American Academy of Child and Adolescent Psychiatry. Practice parameters for the assessment and treatment of children with language and learning disorders. *J Am Acad Child Adolesc Psychiatry* 1998;37(suppl):S46-62

Law J, Boyle J, Harris F, Harkness A, Nye C. Screening for speech and language delay: a systematic review of the literature. *Health Technol Assessment* 1998;2(9)

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For patients

www.kidsource.com/ASHA/index.html (accessed 19 Jan 2004). This link to the American Speech-Language-Hearing Association provides information on speech and language disorders, as well as referrals to certified speech-language therapists

http://members.tripod.com/Caroline_Bowen/devel1.htm (accessed 19 Jan 2004). This site provides useful and theoretically sound information about some aspects of human communication disorders. It also aims to provide a forum where speech and language pathologists, students, practitioners, and researchers can communicate with each other

http://learninfreedom.org/talking.html (accessed 19 Jan 2004). This site is about taking responsibility for your own learning. This specific page provides an overview of resource materials for speech disorders in children

http://pediatrics.about.com/cs/speechdelays/ (accessed 19 Jan 2004). This page provides a comprehensive index of speech development topics and also provides links to other relevant websites

http://selectcommunities.org/form/Page_3x.html (accessed 19 Jan 2004). This page provides a resource of organisations that deal with speech and language development disorders in children. It also provides important links to relevant websites with more information on the topic

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Interactive case report

Treatment of nausea and vomiting during pregnancy: presentation

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This is the first of a three part case report where we invite readers to take part in considering the diagnosis and management of a case using the rapid response feature on bmj.com Next week we will report the case progression and in five weeks' time we will report the outcome and summarise the responses

Ms Reynolds, a 25 year old woman, primiparous with one miscarriage, presented to her general practitioner when eight weeks pregnant complaining of nausea and vomiting. These symptoms were associated with a feeling of light headedness. Ms Reynolds had no relevant medical history and had not suffered from nausea and vomiting in her two previous pregnancies. Initially she was treated with prochlorperazine, which she took for five days, but this did not relieve her symptoms.

She presented again two weeks later, still vomiting up to four times a day, with associated nausea and light headedness. Her blood pressure was 120/75 mm Hg sitting and standing, and urine analysis showed no abnormality.

Ms Reynolds was happy to be pregnant and was living with her boyfriend. Her daughter was 5 years old and fit and well. They lived in a council owned flat with no specific social problems, but she commented that her symptoms were making it difficult for her to cope with looking after her daughter. Having tried prochlorperazine without success, she was reluctant to try further conventional drugs and asked about alternatives.

JOSH SHER/SPL

The safety of all non-prescription medicines is an issue for pregnant women

Questions

1 What would you say to the patient about the safety of treatments (both conventional and complementary) in pregnancy?

2 What study design might provide evidence for their relative efficacy in an individual patient?

3 How would you rate the relevance of such evidence to another patient?

4 How many of your patients are using complementary therapies, and what percentage of pregnant women do you think use complementary therapies such as herbal treatments or supplements during pregnancy?

Please respond through bmj.com

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We welcome contributions of interactive case reports. Cases should raise interesting clinical, investigative, diagnostic, and management issues but not be so rare that they appeal to only a minority of readers. Full details of criteria are available at: bmj.com/cgi/content/full/3267/7389/564/DC1